Breath Alcohol Testing

Frequently Asked Questions

#1 Will a fuel cell based breath testing device respond to substances other than alcohols (ethanol, methanol, isopropyl alcohol, etc.) which are found on the human breath?

"No. Fuel cells will not respond to substances other than alcohols on the human breath."

#2 What units of measure are used to report breath alcohol concentrations?

"The United States assumes a 2100:1 partition ratio; therefore, results are expressed in terms of grams of breath per 210 liters. (i.e. .080 grams per 210 liters of breath or .080 BrAC). Idaho Statute 18-8004(4) states evidentiary tests for alcohol concentration shall be based upon a formula of grams of alcohol per one hundred (100) cubic centimeters of blood, per two hundred ten (210) liters of breath or sixty-seven (67) milliliters of urine."

View the Statute

#3 What evidential breath testing devices (EBT's) are approved for use in Idaho?

"Currently (as of January 2010), the Intoxilyzer 5000, the Intoxilyzer 5000EN, the AlcoSensor-III/IIIA, and the Lifeloc FC20 are the only instruments approved by the Idaho State Police Forensic Services (ISPFS) to perform evidentiary breath testing. The Lifeloc FC20 was approved for use on February 1, 2008 as a replacement for the AlcoSensor-III, which will be supported through the end of January 2013."

FC20 Approval Document

#4 How are new testing devices (EBT's) approved and certified?

"New instruments must be certified by Idaho State Police Forensic Services prior to being placed into service. The certification process evaluates the instrument to ensure the accuracy of results is within the standards as established by the ISP Analytical Method (AM). Upon successful completion of the initial evaluation process, a certificate will be issued approving the instrument for evidentiary testing. Once the instrument has passed the initial calibration (and is approved), the performance of the instrument is monitored by regular field performance verifications. If the instrument fails its required field performance verifications (see FAQ #5), it must be taken out of service and returned to ISPFS for calibration. The instrument will be adjusted, if necessary, and calibrated at the ISPFS Laboratory. The instrument will not be recertified upon repair or calibration, rather the instrument will be approved to be returned to service (a new certificate will not be issued)."

#5 What is the difference between performance verification, calibrations, and adjustments?

"Performance verifications are performed in the field to test the general trending of the

instrument using an ISPFS approved solution. Currently the performance verification solutions are provided by RepCo Marketing Inc. When an instrument tests outside of an established performance verification range, the instrument must be returned to the ISPFS Laboratory for calibration (see FAQ #5). Calibration is the act of checking (by comparison with a standard) the accuracy of a measuring instrument. Calibrations are done under controlled conditions in the ISPFS Laboratory. The instrument result is compared against the target value of the known standard. If the instrument does not produce a result within the tolerances required by the testing program, the instrument will be adjusted. Adjustments fine tune the analytical system so that it will read a known standard properly."

#6 When should the breath testing instrument be calibrated?

"*Each new instrument is calibrated in an ISPFS Laboratory before it is certified for field use (see FAQ#3). Once the instrument passes the initial calibration and is certified for use (ISPFS approved), the performance of the instrument is monitored by regular field performance verifications. Field performance verifications are conducted using a performance verification solution of ethanol-water. Satisfactory field performance verification includes a pair of samples acquired in sequence with the values of both samples falling within the acceptable range. If the result of one (or both) samples is not within the acceptable range, the test may be repeated. If results after a total of three tests (equivalent to six samples) are unsatisfactory, the instrument fails and may not be used for evidentiary testing. If an instrument fails its field performance verification, it must be sent into the ISPFS Laboratory. If an instrument is repaired or serviced by an outside vendor, it must be returned to ISPFS for calibration. ISPFS will return the calibrated and approved instrument to the agency for further use in the field."*

#7 How accurate are approved Evidential Breath Testing Devices (EBT's)?

"ISPFS approved evidential breath analyzers meet <u>and exceed</u> the USDOT requirements of producing results within plus or minus 5% or .005 (whichever is greater) of a known alcohol standard in order to be included in the conforming products list of evidential breath testing devices. Measurement uncertainty percentages for the Intoxilyzer 5000/EN and the Alcosensor III/IIIA are +/-3%. Measurement uncertainty percentages for the Lifeloc FC20 are +/-3.16%, +/-1.81% and +/-2.64% at the critical levels of 0.04, 0.08 and 0.20 respectively. Measurement uncertainty percentages calculated from ISPFS validation studies for each approved instrument are available upon request of ISPFS."

#8 How do I apply the measurement uncertainty percentage?

*"The ISPFS evaluation of precision is based on data obtained under controlled laboratory conditions. The data will only apply in a DUI testing situation when a pair of deep lung air samples are obtained properly and in accordance with the Breath Alcohol Analytical Methods. If the breath sample is inadequate, most likely a lower reading and less agreement between samples (precision) may result. It must be emphasized that the application of the measurement uncertainty percentage results in a value **range**, <u>both below and above</u> the obtained value. An attorney wishing to provide a [+/-] <u>value</u> to a jury would multiply the uncertainty percentage (at the chosen prosecution level) by the breath instrument measured value. For example, if a Lifeloc*

FC20 case being prosecuted at the 0.080 level had a breath result of 0.084, the uncertainty percentage (1.81% or 0.0181) is multiplied by 0.084. The obtained number is then added to and subtracted from the instrument measured value (e.g. 0.084 x 0.0181 = [+/-] 0.00152)."

#9 What can be inferred from "performance verification" performed in the field?

"If the instrument is accurately reporting the target values in the field during the performance verification checks (simulator checks), it is reporting results accurately and is precise to within the ISPFS stated measurement uncertainty percentages. The performance verification results performed in the field do not lend themselves to generating a separate "accuracy number." The variability associated with field performance verification conditions for the instrument does not insure that the data generated would be comparable within a scientific certainty. The performance verification results should only be used to state whether or not the instrument's trend is to under report or over report the given values."

#10 What factors may affect the results of a breath test?

"There are many factors affecting the results of a breath test, most of which result in the underreporting of the breath alcohol concentration of the breath sample. Sources of these factors are the breath testing instrument, and the pair of breath samples which were provided. Any variation in the duplicate breath samples will affect the results. Therefore according to the Analytical Method, duplicate breath samples must agree to within 0.02 of each other in order to be considered valid. If a deep lung air sample is provided for both breaths, then the samples will be within the instrumental precision as reported by ISPFS. Most of the variation in a pair of samples is due to the inconsistency in the breath samples that were provided to the instrument. Results of a complete breath test such as 0.085 and 0.097 (all procedures were followed according to the Analytical Method for the instrument) are outside the expected range of instrumental precision. In order to determine which breath sample is the true breath alcohol concentration, other factors must be considered. The major factors to consider are a variation in breath consistency, or external contamination. The Analytical Method is designed to eliminate an external contamination as a contributing factor to a breath testing result. An external contamination (i.e. mouth alcohol, burping, belching, or vomiting alcohol into the breath pathway) dissipates and is not detectable after the 15 minute observation period. Also, in the presence of an external breath contaminant, the external alcohol source dissipates so rapidly that a duplicate breath sample, separated by a blank, does not produce results within the 0.02 acceptability tolerance. By following the proper procedure, any effect of an external contamination is eliminated. The only other significant factor is a variation in breath consistency. It has been demonstrated that if an individual does not provide a deep lung air sample to the instrument, the results are underreported by the instrumentation."